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Error in DEHP Background Concentration

In the May 1998 issue of *Environmental Health Perspectives*, Woodruff et al. (1) reported an analysis conducted as part of the U.S. Environmental Protection Agency (EPA) Cumulative Exposure Project (CEP). The EPA modeled air concentrations of chemicals listed in the Clean Air Act as hazardous air pollutants (HAPs) in over 60,000 census tracts and compared those concentrations to health benchmarks. The Phthalate Esters Panel of the Chemical Manufacturers Association has become aware of an error in the background concentration value used for bis(2-ethylhexyl) phthalate (DEHP), with the result that modeled air concentrations for DEHP—and thus the potential health hazard—were greatly exaggerated.

Woodruff et al. (1) reported, "Eight pollutants ... [including DEHP] had modeled concentrations exceeding the benchmark concentrations for cancer in 100% of the census tracts. For each of these HAPs,

the background concentration alone ... exceeded the benchmark concentration for cancer, as shown in Table 2." Their Table 2 (1) shows that the background concentration used for DEHP was 1.6 $\mu\text{g}/\text{m}^3$. That value was taken from Howard (2) who reported "mean remote ocean air concentrations" for DEHP of 0.07–0.17 ppb, citing Atlas and Giam (3). However, Atlas and Giam (3) actually reported remote DEHP air concentrations to be 0.32–2.68 ng/m^3 , with a mean of 1.4 ng/m^3 —a value more than 1,000 times less than the background value used for the CEP analysis. The panel has alerted the EPA to this error, and the EPA accordingly has corrected the CEP modeling report (4).

Table 2 of Woodruff et al. (1) shows that if the erroneous background value of 1.6 $\mu\text{g}/\text{m}^3$ is disregarded, the CEP model predicts DEHP air concentrations to exceed the health benchmark of 0.25 $\mu\text{g}/\text{m}^3$ in only 18 census tracts. Even this estimate probably exaggerates the potential health hazard for two reasons. First, to the panel's knowledge, the highest measured ambient DEHP air concentration in the United States that has been reported in the literature is 28 ng/m^3 (5)—an order of magnitude below the EPA's cancer health benchmark. Second, the EPA's health benchmark of 0.25 $\mu\text{g}/\text{m}^3$ was derived using an upper-bound unit risk methodology to extrapolate tumor data in rats and mice to human risk (6,7). However, numerous investigators now conclude that peroxisome proliferators such as DEHP pose little if any human cancer risk and that the quantitative risk assessment for such compounds should be based on a margin of exposure approach (8–10). This would significantly increase the health benchmark for DEHP and decrease (probably to zero) the number of census tracts in which modeled air concentrations would exceed the health benchmark.

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DEHP Correction

We thank Courtney Price for pointing out an error in the background concentration for bis(2-ethylhexyl)phthalate (DEHP) in our paper "Public Health Implications of 1990 Air Toxics Concentrations across the United States" (1). In this paper, emissions data from stationary and mobile sources are used in an atmospheric dispersion model to estimate outdoor concentrations of 148 toxic air contaminants for each of the 60,803 census tracts in the contiguous United States. Outdoor concentrations of air toxics were compared to previously defined benchmark concentrations for cancer and noncancer health effects. Benchmark concentrations are based on standard toxicological references and represent air toxic levels above which health risks may occur.

The results reported for DEHP are incorrect due to an error in the estimated background concentration for DEHP. We had originally used a value of 1.6 $\mu\text{g}/\text{m}^3$ for DEHP, which was reported by Howard (2). As pointed out by Price, Howard (2) had incorrectly reported the value from another source, Atlas and Giam (3). Consequently, we have revised the background concentration for DEHP to 0.0014 $\mu\text{g}/\text{m}^3$, consistent with the mean value reported by Atlas and Giam.

We had reported that the background concentration for DEHP was greater than the cancer benchmark for DEHP. However, the revised background concentration is much lower than the cancer benchmark. Thus, DEHP should not be included in the list of pollutants in Table 2 for which background concentrations alone exceeded cancer benchmark concentrations (1). The

number of benchmark concentrations exceeded by modeled concentrations now ranges from 7 to 31 per census tract, with a mean of 13; approximately half the census tracts have between 10 and 14 estimated hazardous air pollutant concentrations that exceeded benchmark concentrations.

Price also questions whether any concentrations of DEHP would be high enough to exceed the cancer benchmark. The estimated concentrations for DEHP were based primarily on emissions from the Toxics Release Inventory, which relies on self-reporting of estimated emissions from the industry to the public.

We appreciate input on the analysis. In addition, the U.S. EPA Office of Air Quality Planning and Standards is planning to update the modeled air toxics concentration estimates with emissions data

for 1996. Continued feedback on the inputs to the model will help improve the concentration estimates.

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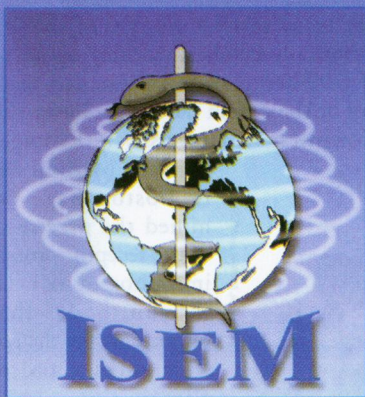
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CORRECTIONS AND CLARIFICATIONS

The photograph by David Tenenbaum used to accompany the article "Fertilizing or Contaminating?" [*EHP* 107(3):A137 (1999)] shows the application of regulated sewage sludge by a municipal sewerage district, not the application of industrial sludge as the caption implies. *EHP* regrets any confusion caused by the use of this photo.

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This conference will provide a forum for experts from different fields to identify and discuss problems of environmental medicine from a multidisciplinary angle. One special theme of the conference will be the diagnosis and description of environmental diseases as well as their prevention and therapeutic approaches. The conference will provide theoretical knowledge as well as the opportunity during the workshops to seek ways and means to implement this knowledge from experienced professionals.